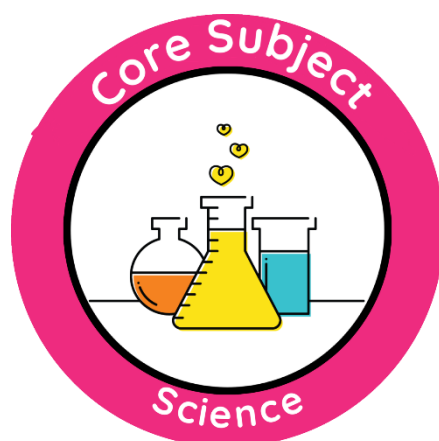


TILERY PRIMARY SCHOOL



SCIENCE POLICY



Ratified by Curriculum Committee: 09 November 2023
Shared with Staff: 05 January 2024
Signed by Chair of Governors: 09 November 2023
Review Date: Autumn 2025

What We will Offer

At Tilery Primary School our aim is to ensure our pupils are naturally curious and inquisitive. We want to broaden their scientific knowledge about the world around them, encouraging them to develop and use a wide range of scientific skills including thinking, discussing, questioning, predicting, investigating, observing, measuring, reflecting, hypothesizing and recording. We aim to provide opportunities for them to use different types of scientific enquiry to answer their own questions by grouping and classifying, noticing patterns, observing over time, researching and comparative and fair testing. Our intention is to broaden scientific vocabulary by building scientific language over time as topics are revisited and to experience the feelings of awe and wonder as they discover new scientific concepts and ideas. We want to develop a love, passion and appreciation for Science in all our pupils and a respect for all living and non-living things that they will carry with them throughout their subsequent years at school into adulthood. Our vision is that our children will be inspired by what they discover in Science lessons, what they learn out about celebrated scientists or at Science themed visits and by visitors to school. We want them to understand and aspire to the many diverse career opportunities available through the field of Science and develop the confidence and belief that they are achievable for all.

Aims & objectives

We follow the National Curriculum for Science which aims to ensure that all pupils:

- develop scientific knowledge and conceptual understanding through the specific disciplines of Biology, Chemistry and Physics.
- develop understanding of the nature, processes and methods of Science through different types of Science enquiries that help them to answer scientific questions about the world around them;
- are equipped with the scientific knowledge required to understand the uses and implications of Science, today and for the future.

Scientific Enquiry

Foundation stage

The EYFS Framework sets out the learning objectives for the seven areas of learning: Physical Development, Expressive Arts and Design, Personal Social and Emotional Development, Literacy, Understanding of the World, Communication and Language and Mathematics. Science in the Early Years Foundation Stage is planned and delivered using the Early Years Curriculum 'Understanding of the World'

Key Stage 1

During years 1 and 2, pupils will be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- asking simple questions and recognising that they can be answered in different ways;
- observing closely, using simple equipment;
- performing simple tests;
- identifying and classifying;
- using their observations and ideas to suggest answers to questions;
- gathering and recording data to help in answering questions.

Key Stage2

Lower KS2

During years 3 and 4, pupils will be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- asking relevant questions and using different types of scientific enquiries to answer them;
- setting up simple practical enquiries, comparative and fair tests;
- making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers;
- gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables;
- reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions;
- using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions;
- identifying differences, similarities or changes related to simple scientific ideas and processes;
- using straightforward scientific evidence to answer questions or to support their findings.

Upper KS2

During years 5 and 6, pupils will be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary;
- taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate;
- recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs;
- using test results to make predictions to set up further comparative and fair tests;
- reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations;
- identifying scientific evidence that has been used to support or refute ideas or arguments.

Concepts & progression of Knowledge & Skills

To ensure there is progression whilst exploring the same topics in Science we have set out the specific set of skills and knowledge which should be taught in each Science unit throughout each child's journey through school. Concept maps and progression tables have been produced which are used by staff when planning lessons. This ensures that as units are re-visited the specific skills and knowledge focused upon are a clear development of the child's prior learning.

Sequencing i.e. revisiting & making connections to previous learning

When planning work which builds on knowledge and skills taught in previous year groups we begin with retrieval skills as a starting point. Asking children questions about when they last visited this topic and what they can recall. As each unit progresses we use a variety of means such as questioning, mini-quizzes etc. to assess if prior learning is embedded.

Cross Curricular Links

At Tilery Primary School, Science is taught as a discrete lesson from Year 1 to Year 6 with links made, where possible and appropriate, to the wider curriculum. Science contributes significantly to the teaching of English in our school by actively promoting the skills of reading, writing, speaking and listening. In maths, Science can contribute many skills such as estimating and predicting, measuring and recording. Science may also have links with other subject areas such as Geography, Design Technology, Art and ICT. Where appropriate a STEM approach is taken.

Inclusion – curriculum for all

During Science lessons we have high expectations of all children and all children are expected to participate in practical investigations as well as recording work. Teachers ensure that children are aware of any hazards and learn how to control them ensuring the safety of themselves and others.

Equal Opportunities

We believe that all children irrespective of background, race, gender and capability should have equal access to the curriculum as stated in each curriculum policy. The school makes every effort to respect and reflect pupils' religious beliefs and take community views into account when teaching Science.

SEN

At Tilery Primary we recognise the need to cater for children with special educational needs. Work is differentiated to assist in children's learning in terms of:

- learning outcomes
- tasks
- teaching methods
- resources
- outcome

Tasks can be broken down into small steps, giving children achievable goals. Vocabulary can be pre-taught, word banks and visual cues can be provided. Activities should reinforce children's understanding of the subject and their basic literacy or numeracy skills should not be a barrier.

How the curriculum prepares children for next stage of education

Each unit of work in Science has been carefully mapped to ensure progression between the year groups throughout school. This includes scientific knowledge, skills and vocabulary that children will retain so helping them build towards the next stage of their education. By Year 6 we expect our pupils to have sound scientific knowledge and understanding and be confident and competent in planning and carrying out scientific investigations ready for secondary school.

How We will Deliver It

Investment in staff /CPD , secure subject knowledge

A new scheme of work has recently been introduced in school to ensure complete coverage of all objectives in each unit. The subject leader's responsibility will be to deliver this through staff meeting time and to monitor and report the effectiveness over the coming academic year via learning scrutinies, pupil voice, learning walks, monitoring assessments and discussions with individual members of staff. Teachers are encouraged to adapt it where necessary or add to it if appropriate. Staff are also encouraged to access

their own CPD or approach the subject leader for assistance and help if needed. If staff feel there are not the appropriate resources to deliver a unit they will inform the subject leader who will aim to provide them from the school Science budget. The subject leader in Science regularly attends working party clusters meetings to discuss best practice with other schools and moderate standards.

The Learning Environment

All classrooms have a Science working wall which will reflect the current unit being taught and display key concepts, relevant vocabulary, photographs and examples of children's work. Health and safety issues will be addressed at the beginning of each lesson where relevant. Children will be encouraged to respect and take care of practical equipment. Children will be encouraged to work collaboratively and should respect and support other pupil's ideas and suggestions. Lessons are engaging and linked to real-life situations. Children are motivated, have fun and feel like real scientists!

Summary of expectations

Our expectations are to ensure that all pupils:

- develop scientific knowledge and conceptual understanding through the specific disciplines of Biology, Chemistry and Physics.
- develop understanding of the nature, processes and methods of Science through different types of Science enquiries that help them to answer scientific questions about the world around them;
- are equipped with the scientific knowledge required to understand the uses and implications of Science, today and for the future.

Quality of teaching & pedagogy

Good quality Science lessons are delivered at Tilery Primary School. The staff at our school are committed to delivering exciting and engaging lessons to all pupils. A good Science lesson begins with the learning objective at the start which is referred to throughout the lesson and evaluated at the end. There are plenty of opportunities for children to develop speaking and listening skills and questions are directed at different levels, including open-ended questioning. We focus on the development of key scientific concepts including conceptual understanding, processes, skills of enquiry and scientific attitudes. Lessons have interesting and varied activities and teachers aim to present Science in practical contexts which are relevant to the children's experiences.

Learning strategies

We recognise the need for the practical nature of Science for our youngest children in school and there are plenty of opportunities for learning through play and first hand experiences in the early years - fostering an attitude of awe and wonder at the world around them. This play and exploration extends into KS1 when Science becomes a discrete lesson with the opportunities for the children to work as a class, in small groups, with a partner or individually. Continuous provision is also offered with hands on, child led activities that allow the children to reflect back on prior learning and become more independent learners. By KS2 children are becoming more confident in investigating their own questions, making decisions for themselves and maintaining a high level of motivation. Children are given the opportunities to plan, carry out and evaluate their investigations and present their findings in a variety of ways. Science working walls will display relevant vocabulary and prior learning for support.

Resources

Science topic boxes are located in the main resource room next to the main hall. All resources are clearly labelled. Specific resources which require upkeep such as class torch sets, batteries and timers can be requested from the subject leader. Resources are continually reviewed and updated throughout the year from discussions with teaching staff and in line with the subject's development and new technological advances. Upon introducing the new scheme the subject leader will endeavour to provide any resources that are not currently available in school from the Science budget to ensure the continuity of high quality provision.

Formative & summative assessment

Through the high-quality teaching of Science taking place at Tilery, acquisition of knowledge will be measured in a variety of ways: teacher observations, questioning during lesson time; class and group discussions, group investigation feedback and presentations, marking children's work; self and peer assessments and quizzes, pupil voice; work scrutiny and using images/videos of children's practical learning.

Formative assessments are used during the lesson to inform the teacher's decision-making process; notifying them when pupils are ready to take the next steps while also providing the flexibility for teachers to respond to the needs of the individual.

Summative assessments will be used to assess the students learning at the end of a unit against the end points. Examples of summative assessments are end of unit tests, final projects and presentations. Cross curricular work will also be taken into consideration.

Assessment is in line with the school's assessment policy. Teachers are expected to assess at the end of every term against the end points outlined on the Science curriculum map for each year group, alongside the key concepts.

Evidence of attainment & progress

Evidence of attainment and progress will be found in photographs, books and displays, through discussions and through end of unit assessments. The subject leader should also contribute to evidence through pupil voice monitoring.

The Difference it Will Make

How is impact measured – have pupils achieved what was intended?

Class teachers will measure the impact of their teaching through formative and summative assessments against the end points and key concepts taught. Children will demonstrate a development of scientific skills and enquiry as they progress through school. There will be an improvement in children's vocabulary during Science lessons. Children will be excited by Science and can relate what they are learning in real-life experiences.

Monitoring & Evaluation of standards - purpose of data

Subject leaders will monitor and evaluate the standards in their subject following the school's monitoring programme. This will include: lesson observations, work scrutiny and listening and recording pupil voice. This will provide the subject leader with the evidence to self-evaluate and make judgements about the quality of the teaching and learning. It will allow the subject leader to identify strengths and areas to improve. This will inform targets on the action plan. The purpose of gathering data is to improve standards,

progress and achievement and will provide teachers with aspects to improve their teaching and children's learning.

Reporting (Governors & Parents)

The subject leader will report annually to the Governing Body. This report will include: achievements, including feedback from events such as Science Week, CPD, quality of teaching and learning, strengths, areas to improve, ways forwards and data. Parents will also receive annual information telling them where their children are working in relation to their age.

Curriculum Enrichment

Learning outside the classroom – Experiences & Opportunities and Capital Culture

Learning outside the classroom begins in EYFS as part of understanding the world. Through topics such as Senses and the Weather, New life, On the Farm and What's Growing in the Garden? children get to explore their outdoor environment observing nature and plants, animals and insects and seasonal changes. Activities involve developing observational skills and using simple scientific equipment such as magnifying glasses, binoculars and gardening tools. As part of their curriculum they are visited by animals found on the farm. From Year 1 to Year 6 staff are encouraged to provide learning experiences outside the classroom. Many of these are pre-planned and link to topics covered such as visits to parks and beaches, Newham Grange Farm, River Tees (Canal River Trust) and The Life Centre. Our younger children continue to experience nature walks at locations away from the school grounds. There is also the opportunity for all children to take part in Forest School activities in our school forest area. Throughout the year we look for events and opportunities taking place linked to Science that will enrich the curriculum to give our children a wide range of cultural activities. As part of Inspiration for Aspiration, visitors are invited into school to talk to the children and the teachers talk to the children, and show videos of jobs the children could aspire to have.

Community links

We inform parents and carers which Science topics we are covering in our class newsletters each term and photos are regularly updated on the school web-site and Facebook page so parents can share what the children have been doing in Science lessons and on trips. We strive to make links within the community via our Inspiration for Aspiration Day and will welcome parents to view what we will be doing to celebrate National Science week each year.

Roles and Responsibilities

The Governing Body

The Governing Body will monitor the effectiveness of this policy and hold the Headteacher to account for its implementation.

The Governing Body will also ensure that:

- Enough teaching time is provided for pupils to cover the National Curriculum and other statutory requirements;
- Proper provision is made for pupils with different abilities and needs, including children with special educational needs (SEN);
- The school implements the relevant statutory assessment arrangements;
- It participates actively in decision-making about the breadth and balance of the curriculum.

Headteacher

The

Headteacher has overall responsibility for the leadership and management of the school. As the leading professional, the Headteacher is responsible for ensuring that this policy is adhered to, and that:

- All required elements of the curriculum, and those subjects which the school chooses to offer, have aims and objectives which reflect the aims of the school and indicate how the needs of individual pupils will be met;
- The amount of time provided for teaching the required elements of the curriculum is adequate and is reviewed by the Governing Body;
- The school's procedures for assessment meet all legal requirements;
- The Governing Body is fully involved in decision-making processes that relate to the breadth and balance of the curriculum;
- Proper provision is in place for pupils with different abilities and needs, including children with SEN.

Role of the Subject Leader

The role of a subject leader is to provide professional leadership and management for a subject to secure high quality teaching, effective use of resources and improved standards of learning and achievement for all pupils.

The subject leader ensures that the policy is adhered to and will:

- provide leadership and direction for the subject and ensure that it is managed and organised to meet the aims and objectives of the school and the subject;
- have responsibility for securing high standards of teaching and learning in their subject as well as playing a major role in the development of school policy and practice;
- ensure that practices improve the quality of education provided, meet the needs and aspirations of all pupils, and raise standards of achievement;
- play a key role in supporting, guiding and motivating teachers;
- evaluate the effectiveness of teaching and learning, the subject curriculum and progress towards targets for pupils and staff, to inform future priorities and targets for the subject;
- produce an annual action plan which will be part of a School Development Plan.

It is important that a subject leader has an understanding of how their subject contributes to school priorities and to the overall education and achievement of all pupils.

Role of the Class Teacher

Classroom staff will ensure that the school curriculum is implemented in accordance with this policy.